What is claimed is:

1. An integrated photonic apparatus comprising:

a glass substrate having a major surface, wherein the glass substrate includes a plurality of regions, each region having a different index of refraction, including a first region having a first index of refraction and a second region having a second index of refraction lower than the first index of refraction; and

a first waveguide formed along the major surface of the substrate, wherein the first waveguide has a higher index of refraction than an intrinsic index of refraction of adjacent portions of the substrate, and wherein the first waveguide passes through the first region and through the second region of the glass substrate.

2. The apparatus of claim 1, wherein the first region includes a dopant including an optically active species.

3. The apparatus of claim 1, wherein the first region acts to substantially confine a pump light.

4. The apparatus of claim 1, wherein a pump light is introduced into the second region, the pump light enters the first region from the second region, and the first region acts to substantially confine the pump light.

5. The apparatus of claim 1, wherein a pump light is introduced into the first region from a face having an area much larger than a cross-sectional area of the first waveguide, and the first region acts to substantially confine the pump light.

6. The apparatus of claim 1, wherein a pump light is introduced into the first region from a first face having an area much larger than a cross-sectional area of the

first waveguide, wherein the first region has a second face that is substantially reflective at a wavelength of the pump light, and the first region acts to substantially confine the pump light.

7. The apparatus of claim 1, wherein a pump light is introduced into the first region from a first face having an area much larger than a cross-sectional area of the first waveguide, wherein the first region has a second face that is substantially reflective at a wavelength of the pump light, and the first region acts to substantially confine the pump light, and wherein a light signal is introduced into the first waveguide at a third face that is substantially perpendicular to the first face and to the second face.

8. The apparatus of claim 1, wherein the first region is a base portion of the substrate, and the second region is a cladding deposited on the substrate.

9. The apparatus of claim 1, wherein the first region is formed at a non-perpendicular angle to a face of the apparatus.

10. The apparatus of claim 1, wherein at least a portion of a length of the waveguide is serpentine.

11. The apparatus of claim 1, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region.

12. The apparatus of claim 1, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side.

13. The apparatus of claim 1, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side, wherein the second region is substantially undoped by active optical species, the first region is doped with an active optical species.

14. The apparatus of claim 1, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side, wherein the second region is substantially undoped by active optical species, the first region is doped with an active optical species, and pump light is launched into the second region.

15. An integrated photonic apparatus comprising:

a glass substrate having a major surface, wherein the glass substrate includes a plurality of regions, each region having a different index of refraction, including a first region having a first index of refraction and a second region having a second index of refraction lower than the first index of refraction, the first region forming a first waveguide for constraining a pump light; and

a second waveguide formed along the major surface of the substrate, wherein the second waveguide has a higher index of refraction than an intrinsic index of refraction of adjacent portions of the substrate, and wherein the second waveguide passes through the first region and through the second region of the glass substrate, and wherein the pump light enters the second waveguide along its side in the first waveguide.

16. A method comprising:

providing a glass substrate having a major surface,

forming a plurality of regions in the glass substrate, each region having a different index of refraction, including a first region having a first index of refraction and a second region having a second index of refraction lower than the first index of refraction; and

forming a first waveguide along the major surface of the substrate, wherein the first waveguide has a higher index of refraction than an intrinsic index of refraction of adjacent portions of the substrate, and wherein the first waveguide passes through the first region and through the second region of the glass substrate.

17. The method of claim 16, wherein the first region includes a dopant including an optically active species.

18. The method of claim 16, wherein the first region acts to substantially confine a pump light.

19. The method of claim 16, further comprising:

introducing pump light into the second region, the pump light entering the first region from the second region, and wherein the first region acts to substantially confine the pump light.

20. The method of claim 16, further comprising:

introducing pump light into the first region from a face of the substrate having an area much larger than a cross-sectional area of the first waveguide, and wherein the first region acts to substantially confine the pump light.

21. The method of claim 16, further comprising:

introducing pump light into the first region from a first face of the substrate having an area much larger than a cross-sectional area of the first waveguide,

wherein the first region has a second face that is substantially reflective at a wavelength of the pump light, and the first region acts to substantially confine the pump light.

22. The method of claim 16, further comprising:

introducing pump light into the first region from a first face of the substrate having an area much larger than a cross-sectional area of the first waveguide, wherein the first region has a second face that is substantially reflective at a wavelength of the pump light, and the first region acts to substantially confine the pump light, and wherein a light signal is introduced into the first waveguide at a third face that is substantially perpendicular to the first face and to the second face.

23. The method of claim 16, wherein the first region is a base portion of the substrate, and the second region is a cladding deposited on the substrate.

24. The method of claim 16, wherein the first region is formed at a non-perpendicular angle to a face of the apparatus.

25. The method of claim 16, wherein at least a portion of a length of the waveguide is serpentine.

26. The method of claim 16, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region.

27. The method of claim 16, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side.

28. The method of claim 16, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side, wherein the second region is substantially undoped by active optical species, the first region is doped with an active optical species.

29. The method of claim 16, wherein the first region crosses a length of the substrate, and the waveguide crosses the length within the first region and is closer to one lateral side of the first region than to an opposing second side, wherein the second region is substantially undoped by active optical species, the first region is doped with an active optical species, and pump light is launched into the second region.

30. An integrated photonic apparatus comprising:

a glass substrate having a major surface;

first waveguide means for constraining a pump light; and

second waveguide means for constraining a signal light along the major surface of the substrate, wherein the second waveguide means passes through the first waveguide means, and wherein the pump light enters the second waveguide means along its side in the first waveguide means.